

REMARKS

Claims 16-29 are pending and have been rejected under 35 U.S.C. §112 and §103.

Claims 16 and 19 are amended herein. Claims 16-29 remain for consideration.

Support for amended Claims 16 and 19 is found in the original disclosure, for example in the Substitute Specification at least at paragraphs [0023]-[0034] and FIGS. 2-4. Thus no new matter is added.

Claims 16-29 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. For claim 16, the Examiner alleges that the term “thin profile” is indefinite because the specification does not allegedly provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Claim 16 is amended herein to delete the term “thin” and clarify that the profile element has a “thickness less than the diameter of the channels.” Amended Claim 16 therefore meets the requirements for clarity consistent with 35 U.S.C. 112, second paragraph. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the section 112 rejection of Claim 16 and the claims depending therefrom.

Claim 19 has been rejected under 35 U.S.C. §112, second paragraph, as allegedly being vague, indefinite and incomplete because the limitation “at least one curved side portion, which has an extension upwards from a substantially plane surface” does not allegedly define its metes and bounds because the orientation of the plane surface has not been defined. Claim 19 as amended herein deletes the word “upwards” and now recites an “extension projecting outwardly from a substantially plane surface.” Claim 19 as amended herein meets the requirements for clarity consistent with 35 U.S.C. 112, second paragraph. Therefore, Applicant respectfully requests reconsideration and withdrawal of the section 112 rejection of Claim 19.

Claims 16-25 and 27-29 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 5,276,718 to Ueda (hereinafter “Ueda”) alone or in combination with U.S. Patent No. 6,470,061 to Helmersson (hereinafter “Helmersson”). This rejection is respectfully disagreed with, and is traversed below.

The Examiner alleges that Ueda discloses all the limitations of Claim 16 except for the cover element with the claimed configuration. In support of the rejection, the Examiner alleges that the language of Claim 16 reads on Ueda, namely: “a) “plurality of channels” reads

on holes 4a of Ueda's Fig. 34; b) "free edge portion with a recess" reads on edges 2d, 2d with a recess between them; c) "thin profile element" reads on element 3b of Ueda's Fig. 35.

Office Action at pages 3 and 4. The Examiner also alleges that element 3b does not substantially encroach on the space of the absorber material 4 and thereby does not substantially reduce the possibility to apply the absorber material 4 near the free end surface of the control rod blade. The Examiner further alleges that the function of element 3b is only to prevent the absorber material 4 from dropping out of openings 2a and its thickness can be optimized to meet the other design constraints on the control blade. *Office Action at page 4.*

Applicant disagrees that the only function of element 3b is to prevent the absorber material from 4 from dropping out of the openings, at least because Ueda discloses that another function of element 3b is to prevent the neutron absorber 4 from being undesirably placed in the region which is exposed to a large amount of neutrons. *Ueda at column 2, lines 65-69.* Applicant also disagrees that element 3b does not substantially encroach on the space of the neutron absorber 4 and does not substantially reduce the possibility to apply the absorber material 4 near the free end of the control blade, at least because Ueda discloses that element 3b should not be less than 0.5 cm in length which limits the possibility of placing the neutron absorber 4 near the free end of the control blade. *Ueda at column 2, lines 65-69.*

Unlike amended Claim 16, Ueda fails to disclose "a profile element having a thickness less than the diameter of the channels, wherein said thickness is measured along an axis of said profile element coaxial with said longitudinal axis." Instead, Ueda discloses that "that the length range l_2 of the neutron absorber 3b disposed in the outer periphery of wing 2 be about 0.5 to 2.0 cm." *Ueda at column 2, lines 63-65.* Ueda is silent on the magnitude of the diameter of the accommodating holes 2b relative to the thickness of the neutron absorber 3b. Thus, Ueda fails to disclose "a profile element having a thickness less than the diameter of the channels," as recited in amended Claim 16.

Regarding the cover element of Claim 16, the Examiner alleges that the cover element (i.e., plug) 43 of Ueda's Fig. 20 has a cover portion positioned outside the recess and forms an external end surface of the control blade in a mounted state and which is sealingly attached to the free edge portion to seal the recess. The Examiner also alleges that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus in Ueda's Figs. 34-36, by Ueda's own teaching to use the sealing configuration shown in Ueda's Fig. 20 that applies a cover element 43 instead of welding the ends 2d, 2d, for simpler construction, because such modification is allegedly no more than the use of a

well known expedient within the nuclear art and the substitution of one sealing configuration with another well known configuration. *Office Action at page 4.*

Unlike the invention recited in amended Claim 16, Ueda does not disclose, teach or suggest that the “profile element and said cover element engage one another and cooperate to define at least one passage there between.” Instead, with reference to Figs. 34-36, Ueda discloses that the “neutron absorber 3b and the stainless steel member 5 are placed in the space 2b before a pair of plate portions 2d confronting each other in the opening portion 2c are bent inward so as to be closed by welding.” *Ueda at column 2, lines 31-34.* Ueda fails to disclose any passages between the stainless steel member 5, the neutron absorber 3b and/or the pair of plate portions 2d. Ueda’s Fig. 20 also fails to disclose any passage between the profile element and the cover element. This is at least due to Ueda’s failure to disclose any profile element engaging the plug 43. Instead, metal wool 46 is enclosed in a portion between the plug and the long-lived neutron absorber. *Ueda at column 19, lines 12-14.* The metal wool disclosed in Ueda is clearly not a passage between the “profile element and the cover element,” as recited in amended Claim 16.

In addition, unlike amended Claim 16, Ueda does not disclose, teach or suggest “a cover element having a cover portion, said cover element being sealingly attached to said free edge portion to seal said recess, and said cover portion is positioned outside of said recess and forms an external end surface of said control rod blade.” Instead, Ueda’s Figs. 34-36 disclose that “a multiplicity of neutron absorbing rods 32 are disposed in line in the sheath plate 33.” *Ueda at column 18, lines 13-15.* The sheath plate 33 is closed on upper and lower ends by upper structure member 35 and lower structure member 36, respectively. *Ueda at column 18, lines 16-18, and FIG. 18.* Ueda’s neutron absorbing rods 32 have “an elongated cladding or covering pipe 40” which is closed on opposing ends by plugs 43. *Ueda at column 18, lines 20-25.* Consequently, the entire rods 32 and the plugs 43 are completely enclosed inside the sheath plate 33 and therefore Ueda’s apparatus of Fig. 20 teaches away from the use of the plug 43 as a “cover element which forms an external surface of the control rod blade” as claimed in the instant application. Thus Ueda’s apparatus of Fig. 20 cannot properly form part of a section 103 rejection.

Ueda’s disclosure of the plug 43 also fails to disclose, teach or suggest sealing the recess as recited in Claim 16, because the recess of Claim 16 “includes outlets for said channels,” namely a plurality of channels. Ueda’s plug 43 is not configured to close more than one pipe 40.

Based on the foregoing, Ueda does not and Ueda's Figs. 34-36 and Fig. 20, do not disclose, teach or suggest all the limitations of Claim 16, as amended herein.

Significant modifications would have to be made to incorporate the plug 43 disclosed in Ueda's Fig. 20, into the apparatus shown in Figs. 34-36 of Ueda. None of the modifications are disclosed, taught or suggested by Ueda. For example, Ueda's plugs 43, upper structure member 35, lower structure member 36 and/or sheath plate 33 would have to somehow be modified to permit the plug 43 to form an external end surface of the control rod blade. In addition, the plug 43 would have to be modified to seal a recess having outlets for a plurality of channels. Thus, one skilled in the relevant art would not modify the plugs 43 to form "a cover element having a cover portion, said cover element being sealing attached to said free edge portion to seal said recess, and said cover portion is positioned outside of said recess and forms an external end surface of said control rod blade," as recited in amended Claim 16.

Even if somehow Ueda's apparatuses of Figs. 20 and 34-36 are combined as suggested by the Examiner, the proposed combination would merely disclose a covering pipe closed on opposing ends by a plug (Fig. 20) within a pair of plate portions bent inward and closed by welding (Figs. 34-36). Therefore, even if one skilled in the art would somehow combine Ueda's Fig. 20 and Figs. 34-36, a point which is not admitted, the proposed combination would not expressly or implicitly disclose, teach, or suggest the subject matter of amended Claim 16.

Consequently, because not all of the recitations of Claim 16 are taught by Ueda's Fig. 20 and Figs. 34-36, individually or in combination, and because the Examiner has improperly combined the apparatus of Ueda's Fig. 20 with that of Ueda's Figs. 34-36, Claim 16 is necessarily non-obvious, and Applicant respectfully requests reconsideration and withdrawal of the rejection of Claim 16, based on Ueda alone.

Regarding the 35 U.S.C. § 103(a) rejection of Claim 16 based on Ueda in view of Helmersson, the Examiner alleges that Helmersson teaches a control rod for a boiling water reactor that teaches sealing the free ends of the blade either by welding (see Fig. 6) or by using a cover element 8 having a cover portion positioned outside the recess and forms an external end surface of the control blade in a mounted state. The Examiner further states that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Ueda's Figs. 34-36, by the teachings of Helmersson to use a cover element instead of welding the ends 2d, 2d.

For reasons stated above, unlike amended Claim 16, Ueda does not disclose, teach or suggest that the “profile element and said cover element engage one another and cooperate to define at least one passage there between.”

In addition, Helmersson does not disclose, teach or suggest that the “profile element and said cover element engage one another and cooperate to define at least one passage there between,” as recited in amended Claim 16. Instead, Helmersson discloses “a control rod . . . with a bar 8 inserted between two adjacent plates 5 which together, with the bar, form a control rod blade,” but fails to disclose any profile element. *Helmersson at column 5, lines 24-26.* Thus Helmersson fails to disclose at least one passage between the profile element and the cover element.

Even if somehow Ueda and Helmersson are combined as suggested by the Examiner, the proposed combination would merely disclose a cover element (Helmersson) inserted between a pair of plate portions (Ueda), but no profile element and cover element engaging one another and cooperating to define at least one passage there between. Therefore, even if one skilled in the art would somehow combine Ueda and Helmersson, a point which is not admitted, the proposed combination would not expressly or implicitly disclose, teach, or suggest the subject matter of amended Claim 16.

Consequently, because not all of the recitations of Claim 16 are taught by Ueda and Helmersson, individually or in combination, Claim 16 is necessarily non-obvious, and Applicant respectfully requests reconsideration and withdrawal of the rejection of Claim 16, based on Ueda in view of Helmersson.

Since it is respectfully submitted that independent Claim 16, is patentable over Ueda alone or in combination with Helmersson and Claims 17-25 and 27-29 depend directly or indirectly therefrom, they too are patentable over Ueda in view of Helmersson.

Claim 26 has been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Ueda alone or in combination with Helmersson and further in view of Research Disclosure 33925/92 (hereinafter RD ‘92).

Since it is respectfully submitted that independent Claim 16, is patentable over Ueda alone or in combination with Helmersson and Claim 26 depends directly therefrom, Claim 26 is also patentable.

Applicant believes that the foregoing remarks are fully responsive to the Office Action and that the claims herein are allowable. An early action to that effect is earnestly solicited.

Should the Examiner have any questions regarding the present application, Applicant respectfully requests that the Examiner contact Applicant's representative at the phone number listed below.

Please charge the \$120.00 fee for a one-month extension of time to Deposit Account No. 503342 maintained by Applicant's attorneys. No other fee is believed due with the filing of this Amendment and Reply. However, if a fee is due, Applicant authorizes the payment of any additional charges that may be necessary to maintain the pendency of the present application to the undersigned attorney's Deposit Account No. 503342.

Respectfully submitted,

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